

Alessandro Pignedoli

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* 7 July 1996

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Personal Information

Date of Birth 7th July 1996.

Place of Birth Genova, Italy.

Nationality Italian.

Last Updated June 2024.

Scientific Interests.

Magnetism, spintronics, skyrmions, unconventional computing.

Education

2022–Present **PhD in Theoretical Physics**, *University of Duisburg-Essen*, Duisburg, Germany, Primary Supervisor: *Prof. Dr. Karin Everschor-Sitte*.

2018–2021 **M.Sc. in Theoretical Physics**, *University of Genova*, Genova, Italy, *110/110 Cum Laude*.

Final dissertation: *Transport of charge and energy in helical topological systems in the presence of Rashba interaction.*

Primary Supervisor: *Prof. Dr. Maura Sassetti*.

Secondary Supervisors: *Dr. Niccolo' Traverso Ziani, Dr. Matteo Carrega*.

Relevant Coursework: Quantum Field Theory, Condensed Matter Physics, Monte Carlo Simulation Methods, Superconductivity.

2015–2018 **B.Sc. in Physics**, *University of Genova*, Genova, Italy, *108/110*.

Final dissertation: *Landau Levels: An introduction to quantum Hall effect.*

Primary Supervisor: *Prof. Dr. Maura Sassetti*

Secondary Supervisors: *Dr. Niccolo' Traverso Ziani*.

Relevant Coursework: Quantum Mechanics, General Relativity, Fluid Mechanics.

2010–2015 **Five-year High School Diploma in Scientific Studies**, *Liceo Scientifico L. Lanfranconi*, Genova, Italy, *92/100*.

Final dissertation: *Formal reflections on the concept of time.*

Class Representative (2014-2015).

Member of students association "Collettivo Lanfranconi" (2011-2015).

Experience

2022-Present **Research Associate**, *University of Duisburg-Essen*, Duisburg, Germany.

Carried out research activities in the frame of my doctoral work with the TWIST Group led by Prof. Dr. Karin Everschor-Sitte. Primarily it involves the modelling of topological magnetic textures, and applications to computing using analytical and numerical methods.

2023-Present **Research Collaboration**, *University of Agder*, Grimstad, Norway.

Actively collaborating on an international research project focused on spintronics technology.

2023-Present **Research Collaboration**, *TU Dresden*, Dresden, Germany.

Actively collaborating with an experimental group at TU Dresden by providing theoretical support and analysis for experimental measurements.

2023-Present **Supervisor**, *University of Duisburg-Essen*, Duisburg, Germany.

○ Bachelor thesis, Finn Feldkamp.

○ Bachelor thesis, Björn Dörschel.

2023-Present **SPP2137 Skyrmionics Young Researchers Representative**, *University of Duisburg-Essen*, Duisburg, Germany.

Serving as a member of the organizing committee, responsible for planning and executing SPP events tailored for young researchers in the field of skyrmionics.

2022-Present **Teaching Assistant**, *University of Duisburg-Essen*, Duisburg, Germany.

○ Physics Lab, Dr. Anna Semisalova.

○ Statistical Mechanics, Prof. Dr. Karin Everschor-Sitte.

○ Electrodynamics, Prof. Dr. Karin Everschor-Sitte.

2021 **High School Teacher**, *Liceo Statale Sandro Pertini*, Genova, Liguria, Italy.

Taught Mathematics and Physics to 2nd, 3rd, and 4th-year classes.

2021 **High School Teacher**, *Istituto Istruzione Superiore Angelo Roth*, Alghero, Sardegna, Italy.

Taught electric systems to 3rd, 4th, and 5th-year classes. Served as a commissioner for the state exam for 5th-year students and organized an online conference to guide students towards career opportunities.

2016-2017 **Crew member**, *Centro Servizi Nautici SNC*, Genova, Italy.

Provided logistical support for Yacht expositions organized by the Ferretti Group across multiple locations, including Genova (Italy), La Spezia (Italy), Cannes (France), Viareggio (Italy), and Monaco (Montecarlo).

2015-2020 **Tutor**

I Tutored in Math and Physics for University and High School students.

2010-2014 **Volunteer**, *Croce D'oro*, Sciarborasca, Italy.

Publications and Patents

2023 **German Patent Application** DE 10 2023 131 706 K. Everschor-Sitte, A. Pignedoli, B. Dörschel. *Pending.*

2023 **German Patent Application** DE 10 2023 131 171 K. Everschor-Sitte, A. Pignedoli, B. Dörschel. *Pending.*

Skills

Programming

- Python Primarily used for data analysis and visualization tasks.
Extensively applied in scientific computing and automation projects.
- Shell Mostly used for automation of tasks such as running simulations.

Software and Graphics

- MuMax3 Micromagnetic simulation software written in Go.
- POV-Ray Use for scientific figures and data visualisation.
- L^AT_EX Use professionally (e.g. for scientific manuscripts) and personally (e.g. for my CV).
- Microsoft Office Use professionally for scientific purposes (presentations, managing data and scientific writing).

Languages

- Italian Native Speaker.
- English Professional Proficiency.
- German Basic Knowledge.
- French Basic Knowledge.

Workshops, Schools, and Conferences Attended

- 2024 **SPP2137 Skymionics Young Researchers Retreat**, *TU Munich*, Dietmannsried, Germany.
Organizer.
- 2024 **Visit TU Munich**, *TU Munich*, Munich, Germany.
Invited Talk: Introduction to Magnetic Skyrmions, Prof. Dr. C.Stein group.
- 2024 **DPG Meeting of the Condensed Matter Section**, *TU Berlin*, Berlin, Germany
Talk: Exploiting the Brownian motion of quasi-particles for unconventional computing.
- 2023 **TWIST Retreat**, Solingen, Germany.
- 2023 **SPP2137 Skymionics Retreat**, *University of Hamburg*, Hamburg, Germany.
- 2023 **GRC Spin Dynamics in Nanostructures**, *Les Diablerets Conference Center*, Les Diablerets, Switzerland.
- 2023 **DPG Meeting of the Condensed Matter Section**, *University of Regensburg*, Regensburg, Germany.
Poster: Exploiting the Brownian motion of quasi-particles for unconventional computing.
- 2023 **DPG Meeting of the Condensed Matter Section**, *TU Dresden*, Dresden, Germany.
Poster: Exploiting the Brownian motion of quasi-particles for unconventional computing.

2022 **PETASPIN School on Spintronics**, *University of Messina*, Messina, Italy.

2022 **European School of Magnetism**, *Saarland University*, Saarbrücken, Germany.